HIGH AFFINITY NANOPARTICLES

ABSTRACT OF THE DISCLOSURE

High affinity nanoparticles are provided, as well as methods for their synthesis and

5   use. The nanoparticles of the invention comprise high affinity molecules incorporated in

a polymeric nanoparticle. The high affinity nanoparticles range in size from about 1 to

about 1000 nm. The high affinity molecules of the nanoparticle have moieties that have

high affinity for target molecules, resulting in the ability of the high affinity nanoparticle to

selectively non-covalently bind to molecular targets. The molecular recognition capability

10   of these particles enables their use in research, diagnostic, therapeutic, and separation

applications. The nanoparticles of the invention may be formed by contacting target

template molecules with a set of building blocks (which includes the high affinity molecule

as one subset of the building block set), which are then polymerized into a network.

Removal of the templates yields a polymeric nanoparticle with three-dimensional binding

15   sites that are complementary in shape to at least a portion of the target and including

high affinity molecules chemically anchored on the surfaces of the binding sites. The

high affinity nanoparticle is then capable of molecular recognition and selective binding to

target molecules when presented with the target molecule in a mixture of molecules.